

REMARKS

The Applicants appreciate the thorough examination of the present application as evidenced by the Office Action of May 27, 2003. In particular, the Applicants appreciate the indication that Claims 10 and 12-16 would be allowable if rewritten in independent form. In response, the Applicants have amended Claim 1 to more clearly define the claimed invention; rewritten Claim 9 in independent form and to overcome the objection relating to the term "relatively"; rewritten Claims 12, 13, and 15 in independent form; added new Claims 68-93; and canceled Claims 30-32 and 34-67. Support for the amendment of Claim 1 and the addition of Claims 68-89 is provided, for example, in the application as originally filed at page 3, lines 18-24. Claims 90-93 include recitations respectively corresponding to Claims 9, 12, 13, and 15.

Accordingly, Claims 12, 13, and 15, have been placed in a condition indicated allowable by the Examiner, and Claims 91-93 are patentable for reasons that Claims 12, 13, and 15 are patentable. Moreover, dependent Claims 14, 16, and 73-87 are patentable at least as per the patentability of Claims 12, 13, and 15 from which they depend. The Applicants will also show that Claims 1 and 9 are patentable for at least the reasons discussed below, and Claim 90 is patentable for reasons that Claim 9 is patentable. Claim 10 has not been rewritten in independent form because Claim 9 (from which Claim 10 depends) is allowable as discussed below. The Applicants further request reentry of previously withdrawn dependent Claims 2-5, 18-29, and 33 as these claims depend from Claim 1 which is patentable as discussed below. Accordingly, the Applicants respectfully submit that all pending claims are in condition for allowance. A Notice of Allowance is thus respectfully requested in due course.

The Title Has Been Amended

The title has been amended to reflect the cancellation of Claims 34-67 (directed to structures) so that only method claims remain pending. In particular, the title has been amended to recite "LOW TEMPERATURE METHODS OF BONDING COMPONENTS", with reference to structures being deleted.

All Claim Objections Have Been Overcome

The Office Action has objected to Claim 9 stating that the term "relatively" is indefinite because it is unclear as to what constitutes a "relatively high diffusion rate." In response, Claim 9 has been amended to recite that "the metal comprises a metal having a ~~relatively high~~ diffusion rate at room temperature at least as high as a diffusion rate of Indium at room temperature." Support for this amendment is provided in the specification as originally filed, for example, at page 8, lines 22-30. Accordingly, all objections to Claim 9 have been overcome.

Claim 9 has also been rejected under 35 U.S.C. Sec. 102(b) as being anticipated by U.S. Patent No. 5,812,925 to Ecer. The Ecer patent discusses materials such as: tantalum, titanium, aluminum, and calcium (Ecer, col. 4, lines 9-10); copper, copper alloys, and steels (Ecer, col. 4, lines 56-57); and copper, iron, nickel, cobalt, and their alloys (Ecer, col. 6, line 23). The Ecer patent, however, fails to teach or suggest allowing diffusion of metal particles comprising a metal having a diffusion rate at room temperature at least as high as a diffusion rate of Indium at room temperature.

Accordingly, the Applicants respectfully submit that Claim 9 meets all requirements of patentability. The Applicants further submit that Claim 10 is independently patentable for at least the reasons indicated at page of the Office Action. Dependent Claim 10 has not been rewritten in independent form because all objections to Independent Claim 9 (from which Claim 10 depends) have been overcome, and because Claim 9 is patentable. In addition, dependent Claims 68-72 are patentable at least as per the patentability of Claim 9 from which they depend. Claim 90 is also patentable for reasons that Claim 9 is patentable.

Claim 1 Is Patentable As Amended

Claim 1 has been rejected under 35 U.S.C. Sec. 102(b) as being anticipated by Ecer. The Applicants respectfully submit, however, that Claim 1 is patentable for at least the reasons discussed below. As amended, Claim 1 recites a method of bonding two components, the method including:

- positioning the components relative to one another to obtain a desired orientation;
- and
- bonding the two components in the desired orientation with metal wherein a temperature of both components is maintained below a melting temperature of the metal while bonding;

wherein a first one of the components comprises a substrate and wherein a second one of the components comprises one of a micro-electronic component, an optical component, or a micro-mechanical component.

In contrast, Ecer discusses "joining processes for aerospace and automotive components" (Ecer, col. 1, lines 33-34.), and more particularly, a "rocket component" (Ecer, col. 4, lines 63). Ecer, however, fails to teach or suggest bonding two components wherein a first one of the components comprises a substrate and a second one of the components comprises one of a micro-electronic component, an optical component, or a micro-mechanical component. Accordingly, the Applicants respectfully submit that Claim 1 is patentable over Ecer. The Applicants further submit that dependent Claims 2-8, 11, 17-29, 33, and 88-89 are patentable at least as per the patentability of Claim 1 from which they depend. Accordingly, reentry and allowance of withdrawn dependent Claims 2-5, 18-29, and 33 is respectfully requested because these claims depend from allowable generic Claim 1.

CONCLUSION

Accordingly, the Applicants submit that all pending claims in the present application are in condition for allowance, and a Notice of Allowance is respectfully requested in due course. The Examiner is encouraged to contact the undersigned attorney by telephone should any additional issues need to be addressed.

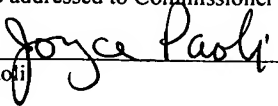
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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner for Patents, Washington, DC 20231, on August 12, 2003.


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